

4th workshop on assimilating satellite cloud and precipitation observations for NWP



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Observation-informed model development for cloud and precipitation

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The representation of clouds, precipitation and their impacts are fundamental for weather forecasting and climate, yet many regime-dependent systematic errors continue to be present in global atmospheric models. There are a wealth of data from passive and active satellite instruments that can help to identify and understand the causes of these errors. In particular, monitoring and assimilation of cloud- and precipitation-sensitive satellite observations in an NWP data assimilation framework is an under-utilised source of information for physical parametrization development.

This presentation will discuss model cloud and precipitation evaluation with satellite observations, highlighting how the evaluation can lead to identification and improvement of specific parametrized processes, such as rain formation and cloud glaciation. A number of examples with the ECWMF global NWP Integrated Forecast System (IFS) will be shown. First guess departures from the assimilation of all-sky microwave channels sensitive to liquid water path continue to play an important role in reducing cloud and radiation errors over the marine stratocumulus and extra-tropical storm tracks. Active observations from radar and lidar (Cloud-Sat/CALIPSO) continue to be highly valuable for evaluating many aspects of the cloud and precipitation fields.

Looking to the future, there is potential for extracting much more information on cloud and precipitation from active and passive satellite observations across the electromagnetic spectrum, and a question to what extent the properties of the global cloud and precipitation fields can be constrained by observations from space.

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